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JCT60 U.S. PTO
01/14/00**PROVISIONAL APPLICATION FOR PATENT COVER SHEET**

This is a request for filing a provisional application for patent under 37 CFR 1.53 (c).

JCT511 U.S. PTO
60/116121
01/14/00

| INVENTOR | | | | | |
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| <input type="checkbox"/> Additional Inventors are being named on the _____ separately numbered sheets attached hereto | | | | | |
| TITLE OF THE INVENTION | | | | | |
| Free Digital TV Service and the Receiver Thereof | | | | | |
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| ENCLOSED APPLICATION PARTS | | | | | |
| <input checked="" type="checkbox"/> Specification Number of Pages | 4 | <input checked="" type="checkbox"/> Small Entity Statement | | | |
| <input checked="" type="checkbox"/> Drawing(s) Number of Sheets | 1 | <input type="checkbox"/> Other(Specify) | | | |
| METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT | | | | | |
| <input checked="" type="checkbox"/> A check or money order is enclosed to cover the filing fees | | | FILING FEE AMOUNT (\$) | | |
| <input type="checkbox"/> The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: | | | \$ 175.00 | | |
| The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government: | | | | | |
| <input checked="" type="checkbox"/> No. | | | | | |
| <input type="checkbox"/> Yes, the name of the U.S. Government agency and the Government contract number are: | | | | | |

Respectfully submitted,

Date 01/14/2000

SIGNATURE Kim Yeong Taeg

TYPED OR PRINTED NAME YEONG-TAEG KIM

REGISTRATION NO.
(if appropriate)
Docket Number:

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|---|--------------------------|
| STATEMENT CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR | Docket Number (Optional) |
|---|--------------------------|

Applicant, Patentee, or Identifier: Yeong-Taeg Kim

Application or Patent No.: _____

Filed or Issued: _____

Title: Free Digital Service And the Receiver Thereof

As a below named inventor, I hereby state that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in:

- the specification filed herewith with title as listed above.
- the application identified above.
- the patent identified above.

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Each person, concern, or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- No such person, concern, or organization exists.
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Separate statements are required from each named person, concern, or organization having rights to the invention stating their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

Yeong-Taeg Kim

NAME OF INVENTOR

NAME OF INVENTOR

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Kim Taeg
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Signature of inventor

Signature of inventor

1/14/00
Date

Date

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Free Digital TV Service and the Receiver Thereof

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Abstract

This invention discloses a Free Digital TV service, which is described as follows. A *Digital TV Service Operator* (SO) is sending a signal over their networks, such as cable or satellite networks, containing bitstreams of regular TV programs and Banner Information intended for commercial advertisement, a user gets the Free Digital TV receiver based upon the agreement between the SO and a user such that the SO can occupy partially the user's video presentation device connected to the Free Digital TV receiver to present Banner Information for commercial advertisement purpose and the SO shall not impose any charge or shall impose little charge to the user for their Digital TV service, where the Free Digital TV receiver consists of a channel demodulator, a *Transport Stream* (TS) demultiplexer, audio and video decoders, a Banner depacketizer which depacketizes the Banner TS Packets carrying coded Banner Information, a renderer which decodes and renders the coded Banner Information into a bitmap video signal, and a video output reconstruction unit which generates the output video signal with the rendered Banner Information and the decoded video output, and then the user's Free Digital TV receiver receives the signal available in the channel, decodes, and delivers the regular TV programs to the user's presentation device and also decodes, renders, and presents the Banner Information to the user's video presentation device.

Detailed Description of the Invention

This invention is an extension of the one filed for the U.S. provisional patent by the same inventor titled as "*Advanced interactive services for digital TV and video service networks*" which was received by the U.S. Patent Office on Dec. 29, 1999.

The following terminology are defined in this invention for systematic description of the Free Digital TV service.

Banner Information is defined as contents in the forms of texts, graphics, images, or etc, intended for commercial advertisement.

Coded Banner Information is a coded bitstream of the Banner Information including all necessary information required for proper rendering process at the associated receiver of the Free Digital TV service. Examples of coding of the Banner Information include, but not limited to, such as JPEG, HTML, Java applet, and etc.

Banner TS Packet is a packetized bitstream of the Coded Banner Information based on the Transport Stream syntax of the international standard ISO/IEC 13818-1.

Rendering refers to the process which decodes and renders the Coded Banner Information into a bitmap video signal so that it can be presented to the user's video presentation device.

Free Digital TV Service

The Free Digital TV service claimed in this invention is a service which fundamentally delivers Digital TV programs without imposing any service charge or with little service charge to the users who granted that the *Digital TV Service Operator* (SO) can present commercial banner advertisement on their video presentation devices. This invention also claims the associated receiver for the Free Digital TV service. The details of the invention is disclosed next.

An SO is sending a signal over their networks, such as cable or satellite networks, containing *Transport Stream* (TS) packets of coded bitstreams of regular TV programs and Banner Information which is intended for commercial advertisement. Coding of programs and Banner Information varies depending on applications. For instance, a video content of a regular program can be coded by using MPEG-2 video codec, an audio content of a program can be coded based on MPEG-2 audio codec or AC-3 codec, and Banner Information can be coded by using JPEG, HTML, Java applet, or etc. The way of generating, multiplexing, and sending TS packets containing the coded regular TV programs and the coded Banner Information can be referred to the international standard ISO/IEC 13818-1, which is also known as the MPEG-2 Systems. This is briefly illustrated in Figure 1. Great details of the MPEG-2 Systems can be also found from the textbook cited below:

Digital Video: An Introduction to MPEG-2, Barry G. Haskell and et. al., Chapman and

Hall, New York, NY, USA, 1997.

Then a Free Digital TV receiver will be available to the users who agreed with the SO upon that the SO can occupy partially the user's video presentation device connected to the Free Digital TV receiver to present rendered Banner Information for commercial advertisement purpose and the SO shall not impose any charge or shall impose little service charge to the user for their Digital TV service, and the user's Free Digital TV receiver receives and demodulates the signal of the channel that the user tuned, decodes and delivers the regular TV programs to the user's presentation device, and also decodes, renders, and presents the Banner Information to the user's video presentation device.

The functional architecture of the Free Digital TV receiver is shown in Figure 2, which consists of a channel demodulator, a TS demultiplexer which demultiplexes the bitstreams of the regular TV programs and Banner Packets, audio and video decoders which decode the coded audio and video contents of the received TV program, a Banner TS depacketizer which depacketizes the Banner Packets and gets the coded Banner Information, a renderer which decodes and renders the coded Banner Information into a bitmap video signal, and a video output reconstruction unit which reconstructs the output video signal with the rendered Banner Information and the decoded video output.

Drawings

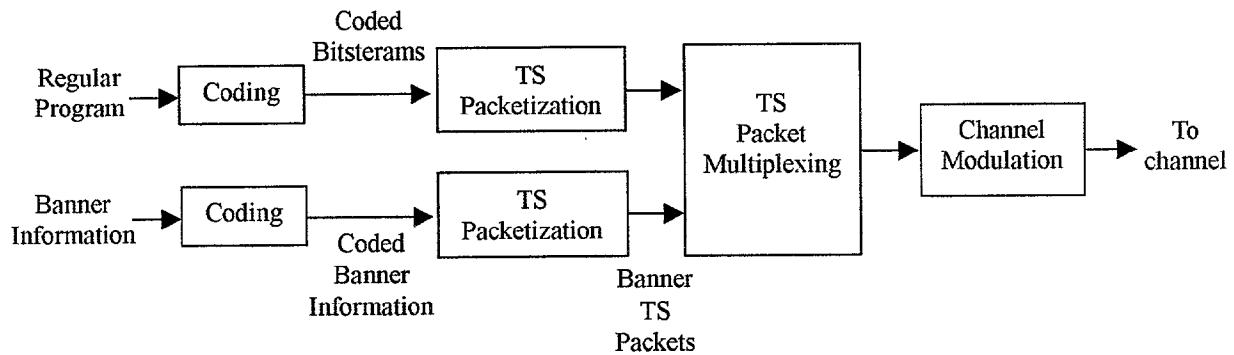


Figure 1. A simplified block diagram illustrating how TS packet stream is generated. For TS packetization, refer to the TS syntax defined in the ISO/IEC 13818-1.

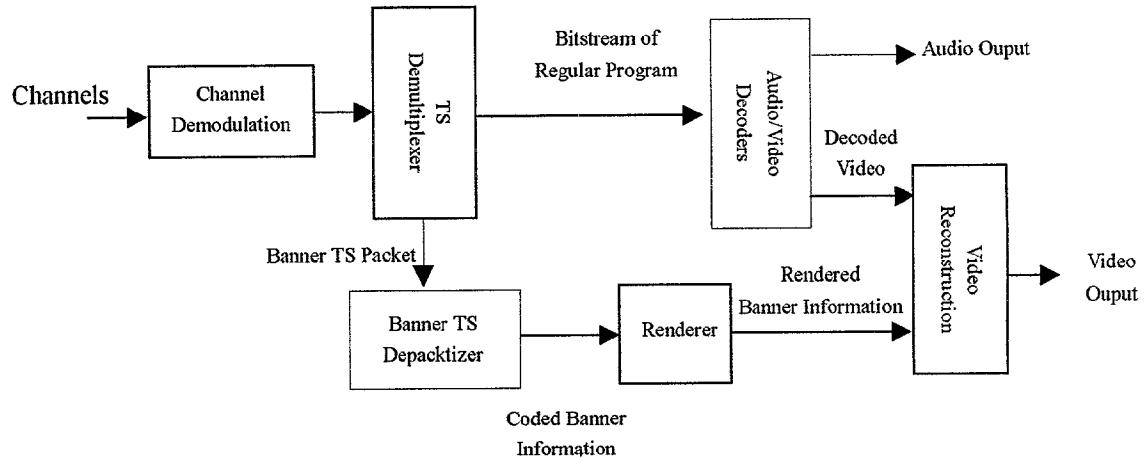


Figure 2. The block diagram of the Free Digital TV receiver.